



The Secretary of Energy
Washington, DC 20585

May 30, 2001

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

We are pleased to forward a report detailing the Department's path forward for addressing the observations outlined in Defense Nuclear Facilities Safety Board Technical Report # 29, entitled *Criticality Safety at Department of Energy Defense Nuclear Facilities* (TECH 29). TECH 29 documents a series of recent criticality safety reviews by your staff at several Department of Energy sites: Savannah River Site, Y-12 Plant, Rocky Flats Environmental Technology Site, and the Hanford Reservation Site.

The Office of Environment, Safety and Health conducted a series of criticality safety reviews in late 1999 to early 2000, and results were published in March, 2000, as the *Report to the Secretary of Energy on the Review of Nuclear Criticality Safety at Key Department of Energy Facilities*. In addition to the sites reviewed by your staff, the Office of Environment, Safety and Health review also included the Los Alamos National Laboratory Technical Area 55, Plutonium Facility-4.

Neither of these reviews revealed imminent criticality safety hazards at Department of Energy facilities. Many of the suggested improvements in TECH 29 are already being implemented, either by actions taken to address Recommendation 97-2 (Criticality Safety) or by actions being taken to address recommendations identified by the Office of Environment, Safety and Health review. However, TECH 29 provides several additional suggestions for further improving nuclear criticality safety. I have reviewed these suggested improvements and agree that they should be implemented. The enclosure presents all the suggested improvements cited in Section 5 of TECH 29 and indicates actions already being taken or identifies specific actions that will be taken, as well as the responsible managers and targeted completion dates.



Because of related responsibility for implementing Recommendation 97-2, Dr. David Crandall, Assistant Deputy Administrator for Research, Development and Simulation, Office of Defense Programs, will oversee actions aimed at addressing areas for improvement identified in TECH 29. He can be reached at (202) 586-0568. The Nuclear Criticality Safety Program Management Team, which was chartered to implement the Department's cross-cutting criticality safety program in response to Recommendation 97-2, reports to Dr. Crandall and will coordinate and assist in completion of actions where appropriate.

Sincerely,

A handwritten signature in black ink that reads "Spencer Abraham". The signature is written in a cursive, flowing style with a large initial 'S'.

Spencer Abraham

Enclosure

**Department of Energy Actions that Address Suggested Improvements
In Defense Nuclear Facilities Safety Board Tech-29 Section 5**

Analyze the Hazards and Develop Controls

1. Improve qualification of contractor and Department of Energy (DOE) criticality safety staff.

This is already being addressed through the Department's actions outlined in the Implementation Plan for Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 97-2.

Commitment 6.6.4 for qualification of Federal staff directly performing criticality safety oversight has been completed as of February 2001. At least one Federal employee at each site with a criticality safety program has qualified in accordance with the Federal Criticality Safety Qualification Standard. Commitment 6.6.3.4, for DOE Field sites to provide line management dates upon which contractors will have implemented guidance for criticality safety training and qualification programs, was completed in April 2001. Contractors are in the process of finalizing their qualification program plans and submitting them to their cognizant DOE Field Offices. An objective of formal contractor qualification is to ensure that all contractors and subcontractors who perform criticality safety work are appropriately qualified.

2. Increase criticality safety engineer time in operating areas.

This suggestion is already being addressed as a result of the Office of Environment, Safety and Health (EH) Reviews and the Deputy Secretary's criticality safety initiative. Task 7 in the Deputy Secretary's memorandum of September 18, 2000, required DOE to hold a workshop to share best practices for criticality safety engineer involvement in operations. One of the workshop tasks was to identify ways to increase the number of hours criticality safety engineers are on the floor where work is done. This workshop was held in Albuquerque on October 23-24, 2000. Ideas were developed for increasing nuclear criticality safety staff time on the floor and provided to the contractors at the workshop to include in their nuclear criticality safety improvement plans that were required by Task 1b in the same Deputy Secretary memorandum.

Action: Field Office Managers will review their contractors' self-improvement plans to ensure that these plans address the issue of criticality safety engineers spending an appropriate amount of time in operating areas.

Responsible Manager: Field Office Managers

Due Date: September 30, 2001

3. Decrease the over-reliance on procedural administrative controls over time.

Both DOE Order 420.1, *Facility Safety*, and American National Standards Institute/American Nuclear Society (ANSI/ANS) - 8.1 cite a preference for engineered controls over administrative controls.

- a. For existing facilities, large scale back-fitting is generally neither cost effective nor appropriate. However, new DOE facility designs should include engineered controls instead of administrative controls wherever practicable. DOE implementation guidance for the 10 CFR 830 Nuclear Safety rule reiterates the preference for engineered criticality safety controls over administrative controls in new nuclear facility designs and emphasizes the need to design in these controls rather than attempting to add them back in at a later date.
- b. The preference for engineered controls over administrative controls will be reinforced by promulgating clear self-assessment guidance for both the contractor and DOE. The guidance regarding preference for engineered controls will be added to the Deputy Secretary's self-assessment criteria and formalized as a DOE Standard. The formalized self-assessment guidance for contractors will emphasize the preference for engineered controls over administrative controls and will encourage operators to identify possible engineered controls and formally disposition them as part of the routine criticality safety evaluation process similar to the current process in place at the Savannah River Site.
- c. The guidance for implementing DOE Field element nuclear criticality safety programs derived from the Deputy Secretary's criteria will include the need to establish nuclear criticality safety performance metrics and to periodically assess implementation of engineered controls during routine reviews of criticality safety evaluations.

Action: The Department will promulgate the Deputy Secretary's self-assessment criteria as a DOE Standard. Additional criteria will be added to address needs cited in Sections 3.b and 3.c above, and to address needs cited in Sections 5 and 8 below.

Responsible Manager: Nuclear Criticality Safety Program Management Team (NCSPMT)

Due Date: December 31, 2002

4. Define the relationship between criticality safety evaluations/controls and authorization basis documents.

One of the recommendations in the EH-2 Report, "Nuclear Criticality Safety at Key Department of Energy Facilities" was to issue guidance for including criticality safety controls in the authorization basis. The Department issued the 10 CFR 830 Nuclear Safety Rule, and EH-53 is currently developing implementation guides which will include requirements for criticality safety.

Action: Consistent with the recommendation in the EH-2 Report, the NCSPMT will task its Criticality Safety Support Group to review EH-53's Nuclear Safety Rule draft guides and provide formal comments to ensure that an appropriate and clear relationship between criticality safety evaluations/controls and authorization basis documents is addressed in the guidance and that surveillance and configuration management of criticality safety design features, described below in Section 9, are also addressed.

Responsible Manager: NCSPMT

Due Date: June 30, 2001

Implementation of Controls

5. Establish a Robust Process for Vertically Tracing Criticality Controls.

Generally, criticality safety controls are traceable from implemented postings and operating procedures back to the parent criticality safety evaluation. Official promulgation of the Deputy Secretary's self-assessment criteria, as described in #3 above, will help address this issue because the lines of inquiry force auditing of the trail of criticality controls from criticality safety evaluation to procedures and postings. Elements will be added to the Deputy Secretary's self assessment criteria to review vertical traceability of criticality safety controls prior to promulgation of these criteria.

Feedback and Improvement - Maintain Controls

6. Improve DOE Field Element Oversight of Contractor Criticality Safety Programs.

The Department is committed to continue making improvements in this area. Several actions which enable better field oversight have already been taken.

- a. Field Office Managers have been directed to correct shortages in nuclear criticality staff where they exist.
- b. In accordance with Commitment 6.6.4.2 in the Recommendation 97-2 Implementation Plan, key DOE Nuclear Criticality Safety staff have been formally qualified per the criticality safety qualification standard. At least one Federal employee at each Field Office where contractor criticality safety programs exist is qualified, and most Field Offices plan to qualify at least one additional staff member over time.
- c. Official promulgation of the Deputy Secretary's self assessment criteria, cited above in #3, will provide the common foundation for continued improvement of DOE Field Element oversight. These criteria were derived from ANSI/ANS 8.19 and are an excellent tool for the field to use to oversee contractor criticality safety programs. They are already being used by most of the Field Office criticality safety personnel to assess contractor criticality safety programs. Implementation of strong DOE and contractor self assessment programs based on these criteria will significantly enhance criticality safety.

7. Ongoing Operator Training and Participation in the Nuclear Criticality Safety Program.

The Department will continue to stress the importance of ongoing operator training in the criticality safety aspects of their jobs and involvement in development of procedures and controls. Operators must be involved in the process used to develop procedures and controls for their operations so they "own" them and understand the basis for them. Task 1b in the Deputy

Secretary's September 18, 2000, memorandum required sites to develop criticality safety improvement plans that address the three Site Opportunities for Improvement described in the report, "Nuclear Criticality Safety at Key Department of Energy Facilities." Three areas of improvement with implementation recommendations were identified. These were: 1) ensuring that criticality controls and their technical bases are understood; 2) ensuring rigorous adherence to procedures and controls; and, 3) improving feedback and improvement processes.

8. Formalize Rigorous Contractor Self-Assessments.

DOE Policy 450.5, *Line Environment, Safety and Health Oversight*, established expectations for contractor self assessment programs. Promulgation of guidance, cited above in #3 above, will formalize a common framework upon which to base contractor criticality safety self-assessment programs.

9. Surveillance and Configuration Management of Nuclear Criticality Safety Related Design Features.

See response to #4 above for linking nuclear criticality safety controls and the authorization basis. In addition, the implementation guidance being developed by EH for the 10 CFR 830 Nuclear Safety Rule will address periodic surveillance and configuration management of design features which provide protection from inadvertent criticality.

10. Develop a Robust Consistent Method for Reporting Criticality Safety Infractions.

Most sites have some form of graded infraction reporting program now. These are very similar in design and have reduced over-reporting. The following sites have a formalized graded approach for infraction reporting: Los Alamos National Laboratory, Y-12 Plant, Rocky Flats Environmental Technology Site, Lawrence Livermore National Laboratory, and the Hanford Plutonium Finishing Plant. These have been very effective in focusing management resources on safety-significant infractions. EH-2 recently reviewed the new reporting practices at Savannah River. Savannah River's new procedure for categorizing nuclear criticality safety infractions should result in equivalent reporting to the five sites mentioned above and reduce over-reporting.

Action: The NCSPMT will work with the Criticality Safety Coordinating Team (Federal criticality safety professionals at the Field Offices) to monitor reportable and non-reportable criticality safety deficiencies throughout the next year and issue a report to the Deputy Administrator for Defense Programs documenting its conclusions and recommendations.

Responsible Manager: NCSPMT

Due Date: September 31, 2002